bcc: W. C. Borden
J. W. Darby
C. R. Hickey
S. D. Liedle
R. C. Noey
R. C. Robertson
E. M. McNamee

Bechtel National, Inc.
Engineers — Constructors
Jackson Plaza Tower
800 Oak Ridge Turnpike
Oak Ridge Tennessee 37830
Mail Address P.O. Box 350 Oak Ridge TN 37831 0350
Telex 3785873

AUG 24 1987

U.S. Department of Energy
Oak Ridge Operations
Post Office Box E
Oak Ridge, Tennessee 37831

Attention: S. W. Ahrends, Director
Technical Services Division

Subject: Bechtel Job No. 14501, FUSRAP Project
DOE Contract No. DE-AC05810R20722
Characterization Planning for SLAPS, HISS, and the Downtown St. Louis Site
Code: 7310/WBS: 153

References:
1. DOE Letter, Ahrends to Hovey, "Characterization Planning for SLAPS, HISS, and Mallinckrodt," dated July 8, 1987
2. BNI Letter, Liedle to McCracken, "Characterization Surveys - St. Louis Area," dated July 31, 1987

Dear Mr. Ahrends:

Attached is a summary of the characterization planning for SLAPS, SLAPS Vicinity Properties, Latty Avenue Sites and the St. Louis Downtown Site. This summary supports the Environmental Review and Analysis (ERA) process for these sites. It is important to note that many of the referenced plans have been prepared prior to the recent development of the ERA process and, as a result, are in a format which is different than that outlined for the ERA Volume 1, Section 3.1. Rather than attempting to revise previously published plans in a format consistent with the ERA process, it was determined during conversations between Steve McCracken and Steve Liedle that a summary of past, present, and future characterization planning (such as that enclosed), would be appropriate for our purposes. This summary including previously published characterization plans and future plans prepared in the ERA format (i.e., downtown site) will be very useful in providing regulatory personnel and the public with an indication of work at the Missouri sites. If there are any questions, please contact Steve Liedle at 576-3997.

CONCURRENCE

SDL

Very truly yours,

G. K. Hovey
Program Manager - FUSRAP

tm
Attachment: As Stated

1585f

S00183716
SUPERFUND RECORDS

1.0 PLANS FOR SITE CHARACTERIZATION/REMEDIAL INVESTIGATION

The Department of Energy (DOE) will complete remedial action at several sites in the St. Louis area. The sites are part of the Formerly Utilized Site Remedial Action Program (FUSRAP) and include:

- Latty Avenue Properties
- St. Louis Airport Site (SLAPS)
- SLAPS Vicinity Properties
- Downtown St. Louis Site

Prior to the completion of remedial action and in support of documentation required by various environmental laws [i.e., National Environmental Policy Act (NEPA), and Superfund Amendments and Reauthorization Act (SARA)], extensive site characterization/ remedial investigation has been completed. Additional characterization needed to refine waste volume estimates and to define waste constituents is currently being planned and will be implemented after review by EPA and the Missouri Department of Natural Resources (MDNR). Various plans are generated to support site characterization/remedial investigation including those for sampling and analysis, health and safety, data management, and community relations. This document provides a summary of sampling and analysis planning which has been completed or will be completed in the near future. Previously published plans are appended for reference.

1.1 HISTORICAL OVERVIEW

In 1974 the United States Congress instituted the FUSRAP. The FUSRAP is an effort directed by the DOE to identify, cleanup, or otherwise control sites where residual radioactive contamination (exceeding current guidelines) remains from activities carried out under contracts with the Manhatten Engineer District (MED) and the Atomic Energy Commission (AEC) during the early years of the nations

atomic energy program. The necessity for the characterization/ remedial investigation activities given in this report arise from the use of the Downtown St. Louis Site, owned and operated by Mallinckrodt, Inc., as a uranium processing facility from 1942 - 1957 under contracts with the MED/AEC.

The Downtown St. Louis Site is located on Destrehan Street in St. Louis, Missouri and covers approximately 45 acres. This site was utilized for several operations involving the processing and production of various forms of uranium compounds and the machining and recovery of uranium metal. During the period of time that operations were occurring at the Downtown St. Louis Site, the waste from these operations were stored at the SLAPS (Ref. 1). In 1966 part of the waste, including ore residues and the uranium and radium-bearing process waste, stored at SLAPS were purchased by the Continental Mining and Milling Company of Chicago, Illinois, and moved for storage to 9200 Latty Avenue, now the Hazelwood Interim Storage Site (HISS). After most of the residues had been removed from SLAPS, all of the existing on-site structures were demolished and buried. In 1969, the St. Louis Airport Authority transported the remaining waste to the quarry at Weldon Springs, Missouri and the AEC-Oak Ridge Operations performed a radiological survey of the property. From 1967 to 1974 the waste at HISS was sold to the Commercial Discount Corporation and shipped to the Cotter Corporation in Chicago, Illinois. Part of this waste was diluted with site soil and shipped to the West Lake Landfill in St. Louis County. Figure 1 shows the location of these sites.

Since the contamination at the Downtown St. Louis Site and at the SLAPS resulted from MED/AEC operations, these sites were included under the FUSRAP. The contamination at the HISS and Futura resulted from commercial operations involving the radioactive material from SLAPS and was not included under the FUSRAP initially. However, in 1984 the Energy and Water Appropriations Act directed the DOE to conduct a decontamination research and development project at four

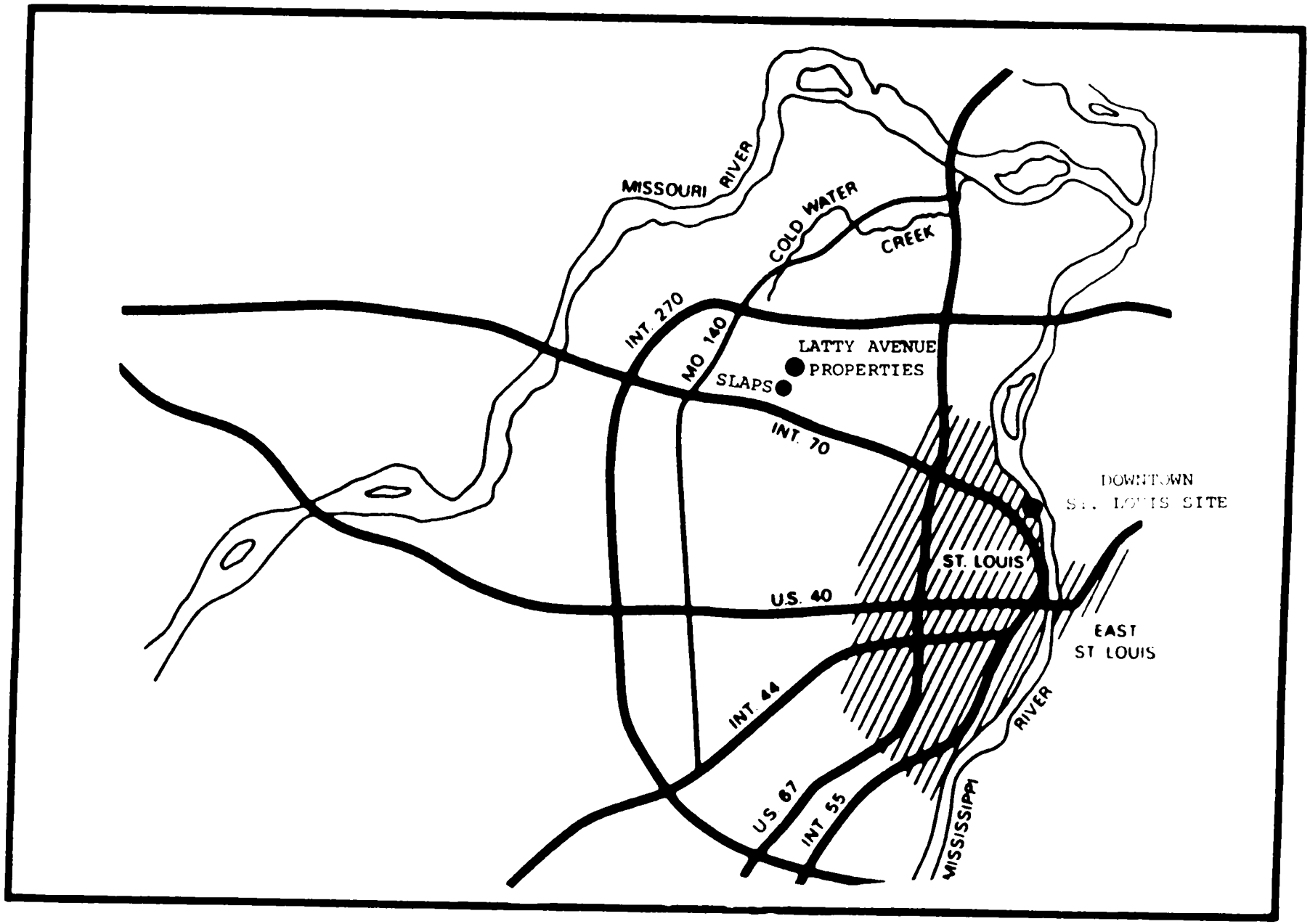

FIGURE 1 LOCATION OF DOE FUSRAP SITES IN MISSOURI

sites throughout the nation, including 9200 Latty Avenue. At this time, the HISS and the Futura Coating sites were added to the FUSRAP by Congress to expedite the decontamination process (Ref. 2).

1.2 SAMPLING AND ANALYSIS PLANS

1.2.1 SLAPS, Latty Avenue Properties and SLAPS Vicinity Properties

The sampling and analysis planning for the SLAPS and HISS has been divided into three areas:

- Latty Avenue Properties including FUTURA and HISS
- SLAPS (on-site)
- SLAPS Vicinity Properties including Coldwater Creek and the haul roads.

Tables 1 - 4 gives the current status of the characterization plans for each of these three areas and Figure 2 shows the location of each area and indicates corresponding plans that have been or will be prepared.

Appended to this report are published characterization plans. These plans include a brief history of each site, the scope and purpose of the characterization activities, the characterization approach and methodology, and the personnel health and safety requirements.

In all of these reports the investigational techniques are very similar. These techniques include:

- Walkover surveys - these surveys consist of gamma radiation scans of individual 50-ft by 50-ft grid blocks. The walkover survey covers essentially 100 percent of the ground surface and ensures that hotspots between grid points are detected.
- Cone-shielded surveys - these surveys consist of cone-shielded gamma scintillometer measurements made at regular intervals. These measurements minimize discrepancies in the size of a given area that might have been created by lateral gamma flux (shine) from other contaminated areas nearby.

TABLE 1

CHARACTERIZATION PLANNING

SLAPS Characterization Planning and Progress

SITE	CHARACTERIZATION PLAN	PUBLISHED	SCOPE	COMMENTS
SLAPS (on-site)	Radiological	July 1986	Walkover survey, coneshield gamma measurements, 22 PIC measurements around site perimeter, 102 boreholes, gamma logging, soil sampling and analysis. Also included limited chemical characterization to investigate potential presence of hazardous chemicals on-site and a limited Hydrogeological investigation.	Field work completed in August 1986, Characterization Report scheduled to be published August 1987. 1st Draft Characterization Report in May 1987. Published limited Chemical Characterization Letter Report: March 9, 1987. Published 1986 Geologic/ Hydrogeologic Letter Report January 21, 1987.
SLAPS (on-site)	Chemical	October 1987 (Planned Date)	Total of 30 holes to be drilled. The same sampling procedure as for the HISS Chemical Characterization is to be followed with one exception: 8 biased holes will be pre-selected instead of 3.	Field work schedule to begin October 1987 with completion of field work scheduled for December 1987. A combined characterization plan for HISS/FUTURA SLAPS is planned. The Characterization Report is scheduled to be published in September 1988.

TABLE 2

CHARACTERIZATION PLANNING

Latty Avenue Properties Characterization Planning and Progress

SITE	CHARACTERIZATION PLAN	PUBLISHED	SCOPE	COMMENTS
HISS	Radiological	October 1986	Walkover Survey, Coneshield Gamma Measurements, 15 PIC measurements, 36 boreholes, gamma logging, soil sampling and analyses	Field work completed in November 1986, Characterization Report published in June 1987.
HISS	Chemical	October 1987 (Planned Date)	Total of 6 holes to be drilled. 3 biased holes sampled in 2' discrete intervals in radiologically contaminated waste for RCRA, volatiles, semi-volatiles, and metals. One sample below rad. contaminated waste sampled for volatiles, semi-volatiles, metals. Other 3 holes chosen randomly - 1 sample from each will be composited in area of rad. contaminated waste for RCRA, volatiles, semi-volatiles, & metals sampling. Then 2' discrete intervals will be sampled as described above.	Field work scheduled to begin October 1987 with completion of field work scheduled for December 1987. A combined characterization plan and chemical characterization report for HISS/Futura is planned. The Characterization Report is scheduled to be published in August 1988.
FUTURA	Radiological	September 1986	Building surveys included Beta/Gamma exposure rate & radon monitoring & air particulate sampling. Grounds surveys included walkover scan, coneshield gamma measurements, 12 PIC measurements, 57 boreholes (10 of these inside buildings), gamma logging, soil sampling, and analysis.	Field work completed in December 1986, Characterization Report published July 1987.
FUTURA	Chemical	October 1987 (Planned Date)	Total of 6 holes to be drilled. The exact same sampling procedure as for the HISS Chemical Characterization is to be followed.	Field work scheduled to begin October 1987 with completion of field work scheduled for December 1987. A combined characterization plan and chemical characterization report for HISS/FUTURA is planned. The Characterization Report is scheduled to be published in August 1988.
HISS VP	Radiological	November 21, 1986 (Letter Plan)	Walkover survey, includes Railroad Property, Wagner Property, and a portion of Stone Property, all adjacent to the HISS. coneshield gamma measurements, 37 PIC measurements, 15 boreholes, gamma logging, 81 hand augered holes, soil sampling & analysis.	Field work completed in December 1987, Characterization Report scheduled for publication April 1988.

TABLE 2

CHARACTERIZATION PLANNING

Latty Avenue Properties Characterization Planning and Progress (Continued)

SITE	CHARACTERIZATION PLAN	PUBLISHED	SCOPE	COMMENTS
VICINITY PROPERTIES ADJACENT TO LATTY AVE.	Radiological	February 12, 1987 (Letter Plan)	Encompasses shoulders along Latty Avenue from the HISS extending to Hanley Road. Walkover survey, coneshield gamma measurements, 312 boreholes, gamma logging, soil sampling and analysis.	Field work completed in June 1987.
	Amendment to Rad. Characterization Plan for Vicinity Properties adjacent to Latty Ave.	June 1, 1987	Encompasses properties adjacent to Latty Ave. Walkover survey, surface soil sampling and analysis.	Field work to be completed in August 1987. Characterization Report scheduled to be published in conjunction with HISS VP in April 1988.

TABLE 3

CHARACTERIZATION PLANNING

SLAPS Vicinity Properties Characterization Planning and Progress

SITE	CHARACTERIZATION PLAN	PUBLISHED	SCOPE	COMMENTS
SLAPS VP	Radiological	October 2, 1987 (Letter Plan)	Includes Ballfield, Coldwater Creek to 200' downstream of the HISS water discharge point, Railroad Track Property forming southern boundary of SLAPS. Included walkover survey, coneshield gamma measurements, 69 PIC measurements, 19 boreholes, gamma logging, 213 hand augered holes, soil sampling and analysis.	Field work completed May 1987. Characterization of SLAPS VP resumed in July 1987. This characterization work also encompasses Airport Property south of Banshee Road & extended Coldwater Creek & ditches beside McDonnell Blvd. Characterization Report for all SLAPS VPs scheduled to be published September 1988.
SLAPS DITCHES	Radiological		Beta-gamma dose rates at ground surface, coneshield gamma measurements, 21 PIC measurements, boreholes along each side of McDonnell Blvd., gamma logging, soil sampling and analysis. Water & stream sediment sampling from Coldwater Creek and ditches along McDonnell Blvd.	Field work completed in June 1987. Characterization Report published in August 1983.
HAULROADS & ADJACENT PROPERTIES IN SLAPS AREA	Radiological	August 1987 (Planned Date) July 1987 (Prepublication)	Encompasses Pershall Rd., Hazelwood Blvd., McDonnell Blvd., and adjacent properties. Walkover survey, soil sampling and analysis, 102 boreholes to be drilled, gamma logging, 135 hand augered holes in Phase I work. Phase II, if required, will be planned after data from Phase I have been analyzed.	Field work for Phase I scheduled to be completed in October 1987. Characterization Report scheduled to be published October 1988.
SLAPS & BALLFIELD AREA	Geological and Hydrogeological	July 1987	Drilling 44 boreholes, installation of groundwater monitoring wells, well-development, civil survey, hydrogeological testing, field permeability testing, groundwater level measuring, chemical/geochemical testing - both field & laboratory testing, geotechnical testing.	Field work scheduled to be completed in January 1988. Characterization Report scheduled to be published in August 1988.

TABLE 4

CHARACTERIZATION PLANNING

Downtown St. Louis Site Characterization Planning and Progress

SITE	CHARACTERIZATION PLAN	PUBLISHED	SCOPE	COMMENTS
Downtown St. Louis Site	Radiological & Chemical & Geological	February 1988 (Planned)	Walkover, boreholes and gamma logging, soil sampling and analysis, building surveys. Chemical testing, geotechnical soil testing. Field work will be conducted in 2 phases.	Field work scheduled to be completed Jan. 1989. Characterization Report scheduled to be published September 1989.

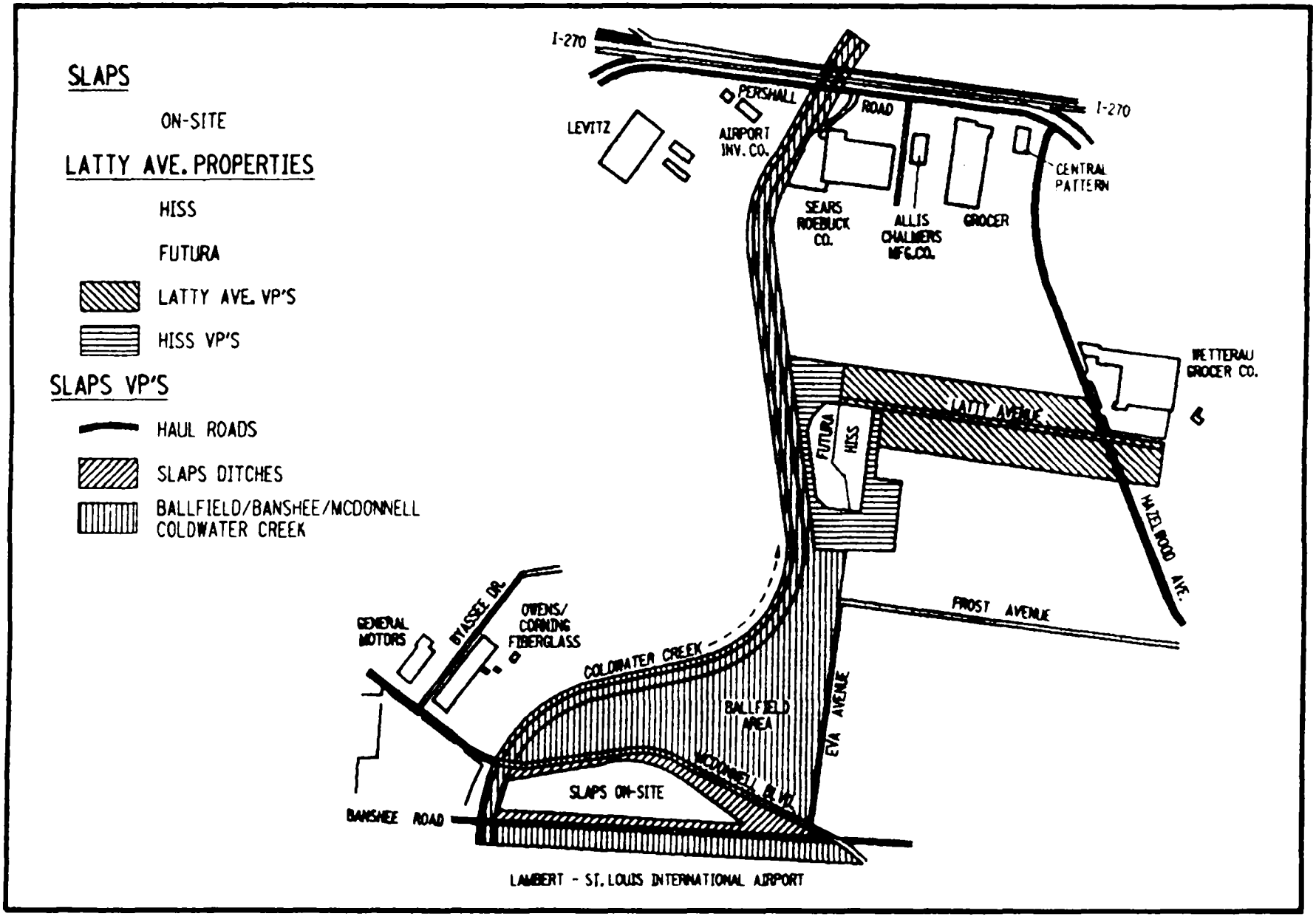

FIGURE 2 OVERVIEW OF THE ST. LOUIS FUSRAP SITES
NEAR THE ST. LOUIS AIRPORT

- Soil sampling - soil samples are collected from both surface locations and boreholes. The surface sampling consists of obtaining a sample from the first 6 inches of soil. Samples from boreholes are usually obtained by driving a split-spoon sampler in advance of the auger and obtaining continuous representative samples from each borehole. Selected soil samples are analyzed for uranium-238, thorium-230, thorium-232, radium-226. Additionally selected samples are analyzed for chemical constituents.

- Gamma logging - gamma logging is performed by lowering a gamma scintillometer into the borehole at 6 inch or 12 inch intervals and obtaining a one minute count. This technique provides an indication of the depth of the contaminated material.

- Drainage pathways sampling - drainage pathways sampling is done by obtaining surface water samples and sediment samples in drainage pathways from areas of concern (if applicable).

In addition to the sampling that is performed to determine the volume and type of contamination present, sampling is also performed of the environmental media to assess the potential hazard to the public from the contamination. Techniques that are used to monitor the environmental media include:

- Gamma exposure rates - quarterly gamma exposure rates are determined by placing thermoluminescent dosimeters (TLDs) at various locations around the sites. These exposure rates provide an upper limit on the exposure that the general public could obtain from the site. In addition to these on-site locations, the TLDs are also placed at locations in the community that has been evaluated as containing no contamination, these locations provide background information.

- Radon measurements - quarterly atmospheric radon concentrations are measured by using Terradex Track Etch detectors. These detectors are placed at the same locations as the TLDs. The atmospheric radon concentration measurements provide an indication of the radon gas produced by the on-site contamination.

- Groundwater analysis - On-site perimeter wells are sampled quarterly. The samples are analyzed for radiological and chemical contamination. These checks provide information about the migration of contaminants into the water table.

- Surface water analysis - surface water samples are obtained from off-site drainage path locations, where appropriate. These samples are tested for radiological and chemical contamination. This information is used to determine if any contamination is migrating off-site.

- Meterological data - area meterological data is obtained to provide information about possible wind blown contamination.

All the above mentioned environmental data are compiled, reviewed, and published yearly in Environmental Monitoring Reports for the SLAPS and HISS.

1.2.2 Downtown St. Louis Site

At the present time the Downtown St. Louis Site characterization plan is in draft. The following gives a brief summary of the characterization methodology that will be presented in the characterization plan.

The characterization of the Downtown St. Louis Site is complicated by the expected presence of thorium-230. The thorium-230 is anticipated because elevated concentrations of thorium-230 have been found at SLAPS and HISS. The reason that thorium-230 creates a problem in characterizing the site is that the thorium-230 has no gamma signature and cannot be detected in the field. To compensate for the presence of thorium-230, the characterization will be done in a phased manner.

The first phase of the characterization will consist of drilling approximately 100 interior and exterior boreholes at selected locations within 5 on-site plants. Soil samples will be collected continuously from each borehole and the holes will be gamma logged. The soil samples from the borehole will be analyzed for radiological contamination (uranium-238, thorium-230, -232, and radium-226) and for chemical contamination. Some of the boreholes will also be extended to provide geological information and a few will be developed into monitoring wells. In addition to the boreholes, a

gamma walkover survey will be performed and alpha and beta-gamma surveys will be carried out in the existing buildings that were used for the uranium operations.

The second phase of the characterization will consist of a series of boreholes placed to find the horizontal and vertical boundaries of contamination. Soil samples from these boreholes will be analyzed for the suspected radiological and chemical contaminants.

1.2.3 Scheduling for the Sampling and Analysis Plans and Field Work

A schedule for the sampling and analysis plans and field work is presented in Table 5. Sampling activities with multiple phases will have only one report which will be prepared at the end of all field and laboratory work. The characterization activities in St. Louis began in May, 1982 and are scheduled for completion in September 1989.

ST. LOUIS AREA CHARACTERIZATION SCHEDULE

LOCATION	TYPE OF CHARACTERIZATION	DATE COMPLETE PLAN	FIELD	LAB	DRAFT REPORT
SLAPS	Radiological	July 1986*	Aug. 1986*	Nov. 1986*	June 1987*
	Chemical (limited)	July 1986*	Aug. 1986*	Jan. 1987*	June 1987*
	Chemical (detailed)	October 1987	Dec. 1987	Jan. 1988	May 1988
	Geological	July 1987*	Feb. 1988	March 1988	June 1988
Latty Avenue Properties					
HISS	Radiological	October 1986*	Nov. 1986*	Feb. 1987*	March 1987*
	Chemical (Limited) (RCRA Char.)	N/A	1984*	1984*	N/A
	Chemical (detailed)	October 1987	Dec. 1987	Jan 1988	May 1988
Futura	Radiological	June 1986*	Dec. 1986*	Feb. 1987*	April 1987*
	Chemical	October 1987	Dec. 1987	Jan. 1988	May 1988
Latty Avenue Shoulders	Radiological	February 1987*	Aug. 1987*	Nov. 1987	Jan. 1988

* Work Completed
** Work Started

0553S

ST. LOUIS AREA CHARACTERIZATION SCHEDULE

LOCATION	TYPE OF CHARACTERIZATION	DATE COMPLETE					
		PLAN	FIELD		LAB		DRAFT REPORT
Area Adjacent to HISS	Radiological	November 1986*	Aug. 1987*	Nov. 1987	Jan. 1988		
HISS Vicinity Properties	Chemical	Not Planned	N/A	N/A	N/A		
SLAPS Vicinity Properties			Phase I	Phase II	Phase I	Phase II	
Ditches	Radiological	October 1986*	Oct. 1986*	Sep. 1987*	Feb. 1987*	Dec. 1987	April 1988
Ballfield/Banshee McDonnell/Coldwater Creek (25 properties)	Radiological	October 1986*	Oct. 1986*	Sep. 1987**	Feb. 1987*	Dec. 1987	March - May 1988
Haul Roads (15 properties)	Radiological	Aug. 1987**	Oct. 1987	TBD	Jan. 1988	TBD	TBD
Downtown St. Louis Site	Combined Radiological, Chemical, and Geological	February 1988	May 1988	Jan. 1989	July 1988	March 1989	July 1989

* Work Completed
** Work Started

05535
08/20/87

2.0 REFERENCES

1. Oak Ridge National Laboratories, Radiological Survey of the Mallinckrodt Chemical Works, St. Louis, Missouri, February 1978.

2. Bechtel National, Inc. Characterization Plan for the Hazelwood Interim Storage Site, Oak Ridge, TN, October 1986.

C - 047107

COMM TYPE O | B | D

COMM REF _____

BECHTEL NATIONAL, INC.
FUSRAP PROJECT – JOB 14501
COMMUNICATIONS DISTRIBUTION

SUBJECT Characterization Planning for Slaps, Hoss & Downtown St. Louis Site

FROM G Hovey TO S. Arenson

COMM DATE 08/29/87 ADDR CODE [ ] [ ] (NUMBER / ST) CLOSES CCN _____

SUBJECT CODE 7310 WBS 153

AFFECTED DOCUMENT _____

RESPONSE TRACKING INFORMATION		
	DUE DATE / /	RESPONSIBLE ORG _____ RC _____
	RESPONSIBLE PERSON _____	CLOSING DATE / /
	CLOSING CCN _____	CLOSING COMM REF _____

DISTRIBUTION	CODE	W/A	W/O	DISTRIBUTION	CODE	W/A	W/O
PROGRAM MANAGER	PD	1		PROJECT MANAGER J. ARENSON	PM		
DEPUTY PROGRAM MANAGER				P. CROTWELL	PM		
HAZARDOUS WASTE	HW			J. KANNARD	PM		
PROJECT ENGINEERING	PE			S. LEIDLE	PM	1	
ENVIRONMENTAL HEALTH & SAFETY	EH	1		DOE's Copy Sent			
TASK SUPERVISOR C. HICKEY	EH	1		a McNamee		1	
C. LEICHTWEIS	EH			J Davis		1	
HEALTH & SAFETY	EH			R. Neby		1	
SITE ASSESSMENTS	EH	1					
ENVIRONMENTAL SCIENCES	EH			Reading File			1
TMA/EBERLINE	EH			SITES:			
PROCUREMENT	PO			102 ALBANY RESEARCH CENTER			
FIELD CONSTRUCTION	FC			131 U. OF CHICAGO			
OPERATIONS	OP			115/202 NFSS			
PROJECT CONTROLS	PC			117/118 MIDDLESEX (MML/MSP)			
PROJECT QUALITY ASSURANCE	QA			137 WAYNE (WISS)			
PROJECT ADMINISTRATION	PA			138 MAYWOOD (MISS)			
PUBLIC RELATIONS	PR			139 COLONIE (CISS)			
TECHNICAL REPORTS	TR			140 HAZELWOOD (HISS)			
PDCC	DC	COR		153 SLAPS			

COMMENTS _____

PLEASE RETURN TO PDCC FOR CORRECTIONS

C18 F 0781